Higher Education Inequalities in Brazil

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Abstract

In the early 2000s, the Brazilian government implemented policies aiming to expand access to higher education to students from disadvantaged socioeconomic backgrounds. Using the dataset from the Higher Education Exam, this research analysed the change in the socioeconomic profile of students finishing four undergraduate courses (Medicine, Law, Computer Science and Mathematics) from 2004 to 2016. Research was also done into the change in the socioeconomic profile depending on the administrative type of the higher education institution or the time of the day that the course was offered. Descriptive statistics and contingency tables of students' socioeconomic background throughout the years are displayed. The results demonstrated that the expansion of higher education increased the number of students from more disadvantaged socioeconomic backgrounds in Law, Mathematics and Computer Sciences. However, students in Medicine continued to be from a more advantageous socioeconomic background. Moreover, when considering the type of higher education institution and time of the day the course was offered, students from an advantaged socioeconomic background finishing a Law degree tend to study in the morning and in the prestigious public higher education institutions in Brazil.

1 Introduction

Aim 1.1

The aim of this research is to discover whether or not there has been a change over the last 12 years in the socioeconomic profile of students completing higher education in Brazil.

Background 1.2

Brazil achieved economic stability during the 1990s and this reduced levels of poverty and inequality in the country (Torche, 2014). This led to an increase in demand of highly skilled employees and in turn access to higher education degrees. Consequently, the country had huge education reforms, resulting in educational attainment increasing from 3.8 years of schooling in 1990 to 7.2 years by 2010 (Bruns et al. 2011). Studies show that the effect of a student's socioeconomic background and their likelihood of completing lower levels of education have decreased greatly (Do Valle Silva, 2003). This research is going to focus on finding out if the same is true for the higher education system in the country. Higher education in Brazil is split into public and private universities. Public universities are free to students and therefore offer more limited spaces on their courses, this means they tend to accept those with only the highest marks on the very competitive entrance exam, resulting in those from more privileged backgrounds (who will have attended private high schools, preparing them more thoroughly for said exam) gaining access to these prestigious public universities, whilst those students whom attended lower-quality public high schools end up in low-quality private universities. To help reduce the relation between education levels and social inequalities the Brazilian government put numerous educational policies in place to expand access to higher education for students from disadvantaged socioeconomic backgrounds and starting in 2001, several public higher education institutions implemented affirmative action policies. The federal government also implemented policies aiming to increase the number of students in higher education by creating institutions in remote places in the country, increasing capacity of existing public institutions, providing scholarships for students studying in private institutions, increasing the number of courses offer at night in public institutions[1], and allocating 50 per cent of places in federal universities to students who attended public upper secondary education.

Research 1.2

To help investigate the aim, three research questions were formed on which the following report will be structured around:

1. Is there a change in the socioeconomic profile of students graduating in Medical School, Law School, Mathematics and Computer Science in the last 12 years in Brazil?
2. Is there a change in the socioeconomic profile of students when we consider the type of higher education institution?
3. Is there a change in the socioeconomic profile of students when we consider the time of day they attended the course?

[1] Universities in Brazil offer night time courses of the same standard as day courses (by law) this was introduced to make prestigious universities more inclusive of students from lower socioeconomic background as this allows them to work throughout the day to fund their education or support their families.

Medical School, Law School, Mathematics and Computer Science courses were chosen to be the focus of this research as they having varying qualities which will give a fairer view of the overall change in the socioeconomic profile of students in higher education in Brazil. Medicine is a very elite course dominated by people from more educated backgrounds as well as being the highest earning degree in Brazil (R$8459.45, average monthly income), Law School was chosen for a similar reason: with it having a very high enrolment rate as well as being the highest earning humanities degree (R$4675.19, average monthly income) (Dias Lopes, 2016). Due to Brazil being a NIC (Newly Industrialised Country) they are continuously trying to keep up with technological advancements elsewhere hence Computing Science was selected, as it's an ever growing necessity in the current economic climate. Mathematics was picked as it is interesting to see the change of students within what is thought to be a traditional and low earning degree.

The Higher Education National Exam (ENADE) datasets were used to examine the change in the profile of students completing higher education in Brazil. The Higher Education National Exam was created in 2004 and is used as quality control of the students. ENADE evaluates different undergraduate courses every year with students in their first and final year sitting the test, they are also required to fill out a socioeconomic questionnaire, the results from this questionnaire were used as the data for this research. Although the ENADE questionnaire that was processed has data on students both in their first and last year of higher education, this research only contains figures relating to those in their final year as Brazilian undergraduate degrees tend to be achieved over a long period of time (around five to six years) and this results in an elevated dropout rate(more than half of all students) (The Economist, 2012) as the students have money worries and difficult schedules, meaning using data from first year students would give a false impression of whether the socioeconomic profiles of students coming out with a higher education degree has changed, especially as those from lower socioeconomic backgrounds are more susceptible to dropping out.

2 Methodology

Datasets 2.1

For processing all the data and graphs the software R was used. As stated in the previous section the data used was from the socioeconomic questionnaires that are filled in alongside the ENADE test in Brazilian higher education institutions. Twelve separate datasets were used (one for each year being researched (2004-2016)) these were then combined into three datasets. The first contained the data from 2004, 2007, 2010, 2013 and 2016: this was used to analyse the students in Medical School. The second contained data from 2005, 2008, 2011 and 2014: this analysed both Mathematics and Computing Science. The final dataset was of students in 2006, 2009, 2012 and 2015, this was for analysing Law School students. The data had to split it in this way as each year's data only contained select courses and therefore subjects can only be analysed in those particular years.

R packages such as "ggplot2" were used to create graphs displaying the findings, also the "reshape" package was used to format tables correctly. This software allowed for Pearson chi-squared tests to be carried out simply, these tests allow us to accept the null hypothesis or

reject it by the significance level of the p value, if p<0.01 this means the null hypothesis is rejected.

Research Points 2.2

R was used to research various variables that contribute to an individual's socioeconomic background, these factors were: sex, family income, race, high school education and parental education. By transforming data for these variables into graphs and charts it lets us better view the changes that have taken place within the makeup of the higher education system.

3 Results

Only graphs showing race, family income and high school education are displayed in this section of the report as they display the most significant findings other graphs showing as well as tables (for private and public or day and night) can be found in the appendix.

Medicine 3.1.1

Medical School in Brazil as in the rest of the world is a very prestigious course to be accepted into and to complete with a degree. This has resulted in it being dominated by students from higher socioeconomic backgrounds who can afford to have the best high school education which has better prepared them for the extensive and thorough course.

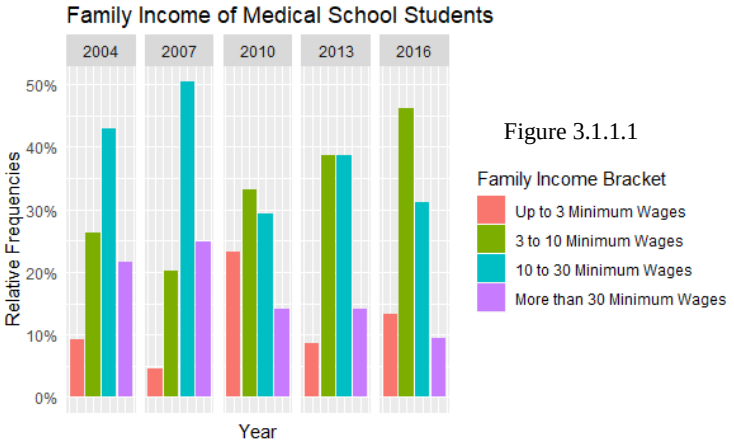


Figure 3.1.1.1

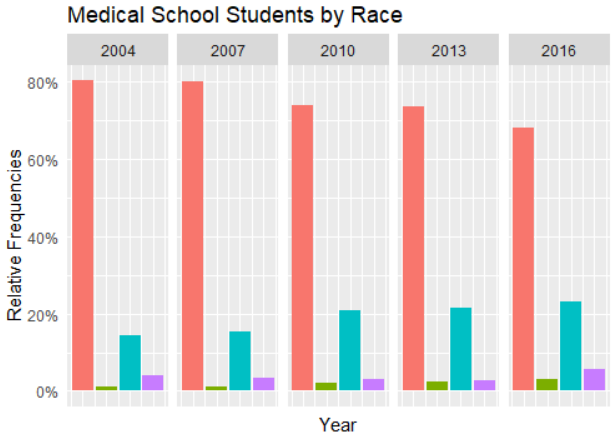


Figure 3.1.1.2

These graphs show that there has been little change within the socioeconomic background of Medical School students, as they are still mainly white and come from very well educated backgrounds, with 76.48% of student's coming from private high schools (Figure 3.1.1.3). Family income shows the most change with a drop from 21.53% of students coming from the richest bracket of families (more than 30 minimum wages) in 2004, to only 9.46% in 2016 (Figure 3.1.1.1). Parental education is extremely high for all those in Medical School too, with figures consistently showing that over 60% of parents had achieved a degree or above (Figure 3.1.1.4) Medicine also saw a large increase in the number of females participating in the course (Figure 3.1.1.5).

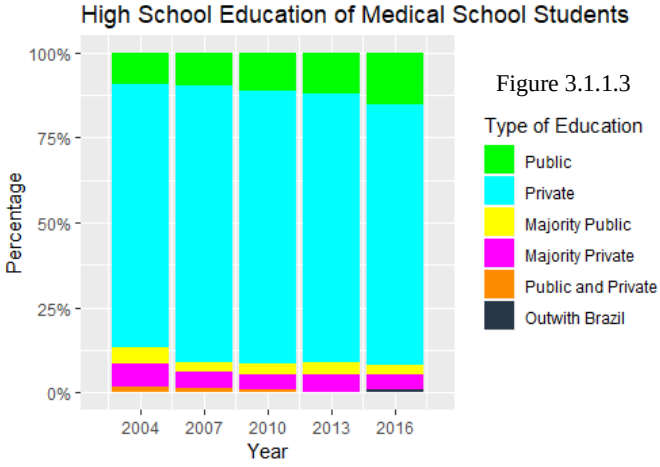


Figure 3.1.1.3

Law 3.1.2

Law School in Brazil has huge enrolment rates due to its diversity for future career paths as well as the higher rates of pay that are associated with the subject. Law degrees often tend to run in families as children follow their parents on this path. But in recent years this has changed in Brazil as people from lower socioeconomic backgrounds have decided to choose this path to follow as they have come to realise these benefits and due to the educational reforms that have taken place access has been easier for them.

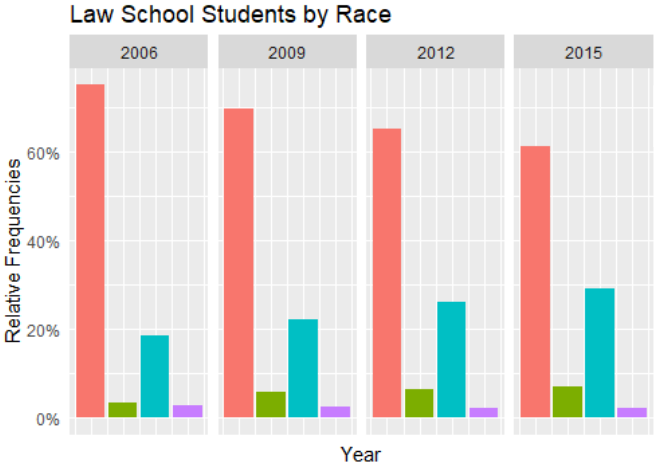


Figure 3.1.2.1

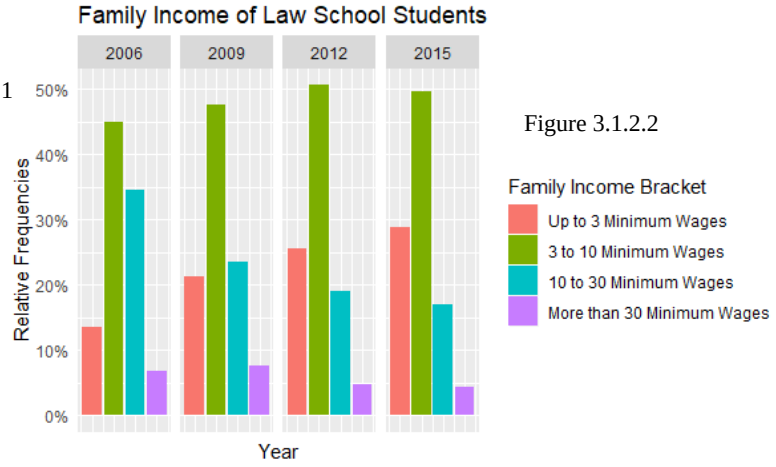


Figure 3.1.2.2

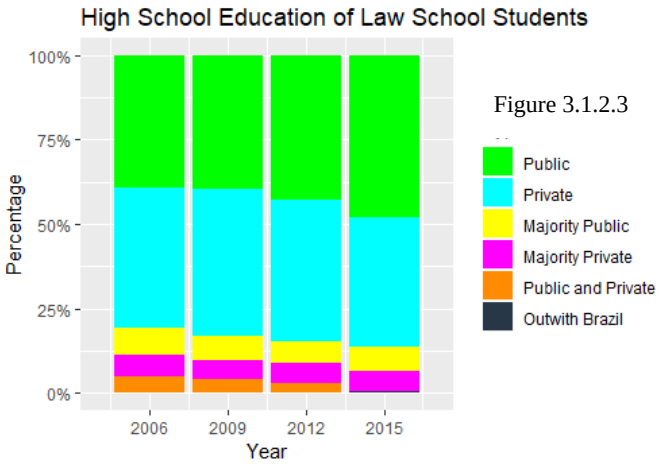


Figure 3.1.2.3

The graphs for Law School show significant change in certain areas of students socioeconomic profiles. There has been a 13.8% rise of non-white students in Law (Figure 3.1.2.1), and a 15.29% rise in students from families that earn “up to three minimum wages” (Figure 3.1.2.2), this shows that over the nine years (2006 – 2015) that this survey covers there has been a steady increase of those from more disadvantaged backgrounds. There was very little change in regard to sex for Law students (Figure 3.1.2.6). In terms of previous education, it has become fairer to students from public school with 48.12% of students in 2015 coming from these schools (Figure 3.1.2.3). The parental education of Law students is very high with both mothers and fathers earning predominately degrees themselves (Figure 3.1.2.4, Figure 3.1.2.5).

Mathematics 3.1.3

Mathematics is one of the core subjects learnt and tested in all levels of Brazilian education (the other being Portuguese). Mathematics is not known for being a particularly high earning degree in relation to the possibilities of Law and Medicine, however due to it being a core subject many students that have not had a view of other possible courses may choose to fall back onto it, as in general people with a degree in Brazil make substantially more than those without one, these students are more likely to be from lower socioeconomic backgrounds.

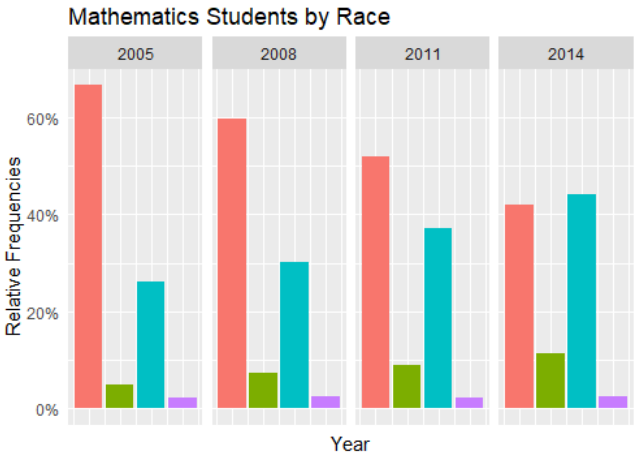


Figure 3.1.3.1

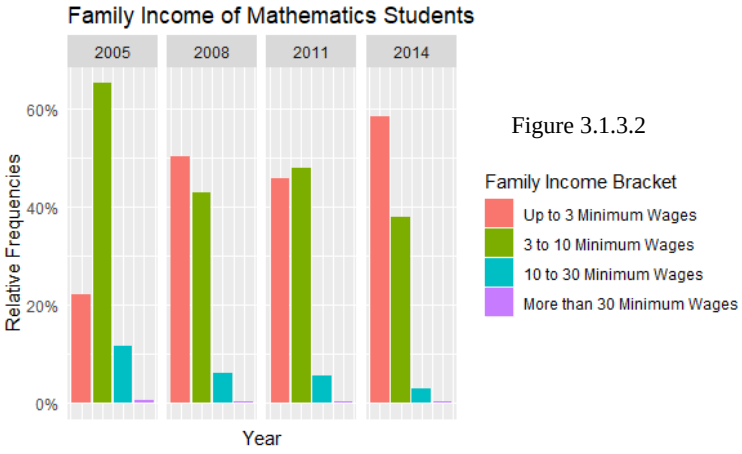


Figure 3.1.3.2

Mathematics has had a surge in the number of mixed race students increasing 18.08% from 2005 to 2014 where these students now outnumber the white students (Figure 3.1.3.1). Figure 3.1.3.2 shows that students from lower income families have always been prominent in this course with only 0.1% coming from the wealthiest families, yet there has still been an increase of 36.24% in the number of students from families earning "up to three minimum wages". This course is unusual in that the percentage of female's fell over the duration (Figure 3.1.3.6). Mathematics students tend not to come from particularly well educated backgrounds with over 40% of fathers (Figure 3.1.3.4) and 30% of mothers (Figure 3.1.3.5) only gaining primary school education, whereas the pupils themselves have mainly always came from public high schools (Figure 3.1.3.3).

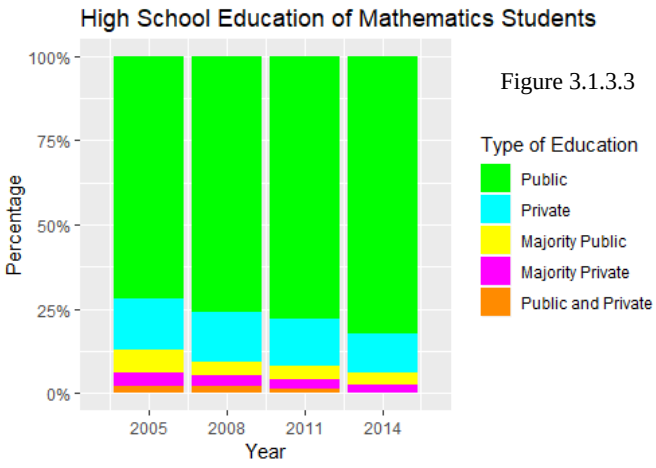


Figure 3.1.3.3

Computing Science 3.1.4

Computing Science is ever growing in Brazil as more and more people attend this course in attempt to be on the forefront of major technological developments within the country. Computing Science has a lot of potential for students and this is likely to encourage those from all backgrounds to apply.

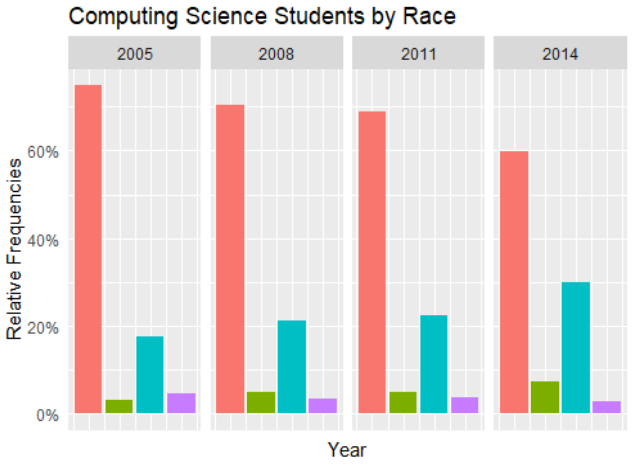


Figure 3.1.4.1

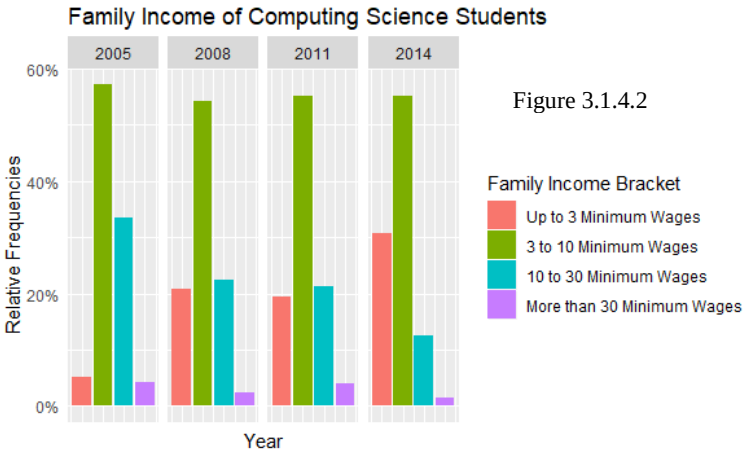


Figure 3.1.4.2

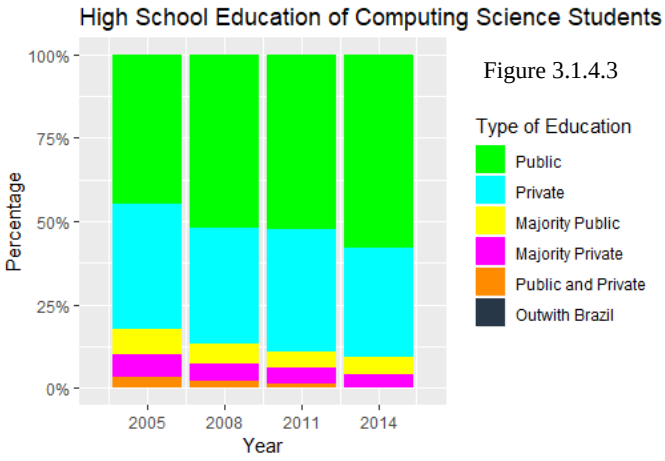


Figure 3.1.4.3

The results for Computing show that in the past there has previously been an equal split of students from public and private high schools but as of 2014 more came from public schools (Figure 3.1.4.3). More Computing students are non-white than in the past with Figure 3.1.4.1 showing a steady increase in both black and mixed race students. Figure 3.1.4.2 shows that students in Computing are beginning to come from lower socioeconomic backgrounds with students from families earning "up to three minimum wages" increasing by 25% in nine years. The majority of Computing students' parents completed upper secondary education and there has been an increase in the number with no previous schooling at all meaning those from less advantaged backgrounds are receiving more access to Computing courses (Figure 3.1.4.4). Computing still has a very clear divide between males and females and over the course of this research the gap has widened further with 82.6% of students being male in 2014 (Figure 3.1.4.5), women have been historically underrepresented in STEM fields of study (Miyake 2010) and from the results, the expansion policies in Brazil are not helping to reduce the gap.

Overall Change 3.1.5

In general, there has been significant changes in the socioeconomic profile of students in the selected courses, the main changes come under race, family income and which type of high school was attended, although there were changes in parental education and sex they are not very significant in comparison. The percentage of students coming from families with the lowest bracketed income (up to three minimum wages) has increased greatly, suggesting that the educational policies are successful at expanding access to students from disadvantaged socioeconomic background. The increasing diversity also suggests that the affirmative action policies are working to some degree, especially in Mathematics, as more and more non-white students are now completing their degrees. Across all researched courses the number of students coming from low-quality public schools has increased this suggests that policies that allocated places in public higher education institutions to students who studied in public high schools are effective. Overall students from lower socioeconomic backgrounds are benefiting from the educational reforms in Brazil as it has created a more equal education system, especially for those with less funds which is a great issue in Brazil. All courses show these positive changes however Medical School has progressed the least most likely due the field being so elite and difficult to access (even for privileged students), and therefore the rest of this report will focus on Law School, Mathematics and Computing Science as there is no necessary reason to search for changes within the subsets of Medical School when the overall change is so low in itself.

Public and Private University 3.2

As mentioned earlier there are considerable difference between private and public institutions in Brazil and it's important to research this in order to not make generalisations about the divide. Comprehensive tables can be found in the appendix for these results. The main analysis of this section was done using chi-square tests as to whether the variable affected which type of institution students entered.

Law 3.2.1

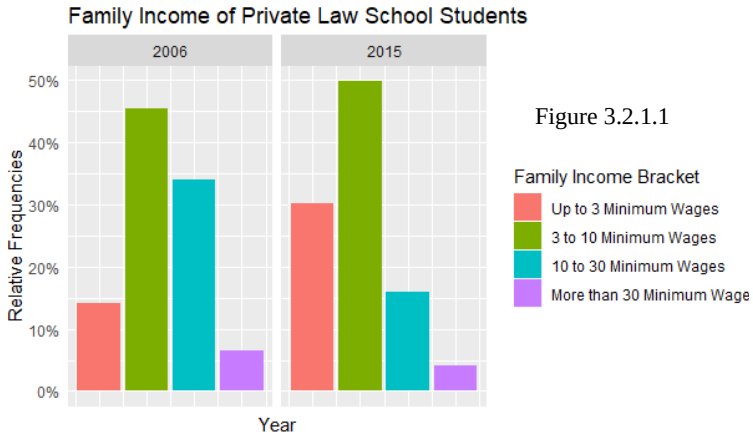


Figure 3.2.1.1

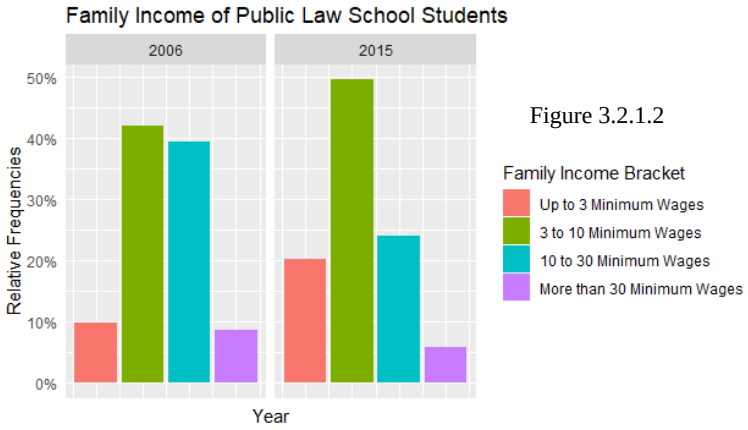


Figure 3.2.1.2

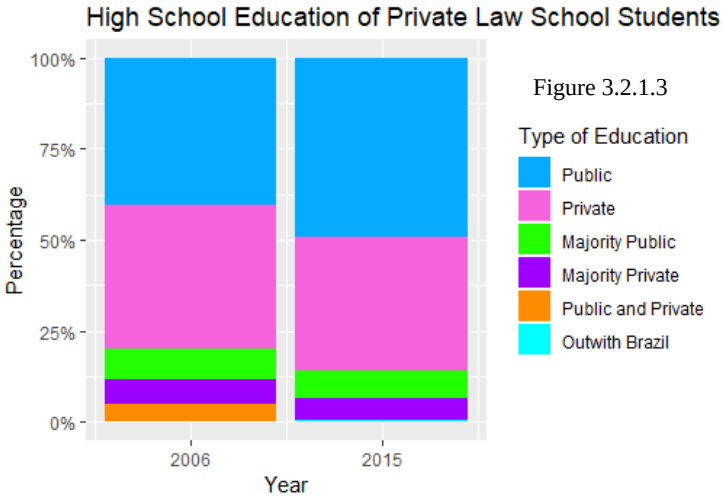


Figure 3.2.1.3

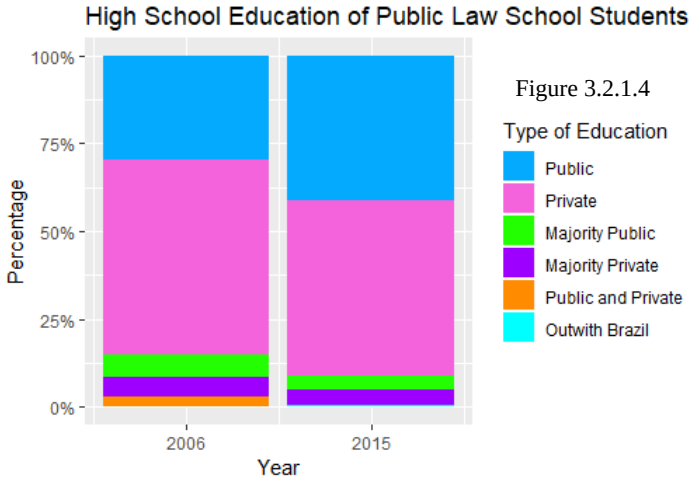


Figure 3.2.1.4

Chi- Square Results

<u>Race</u> • 2006- X^2- 42.15736, d.f = 3, p < 0.001 • 2015 - X^2- 3.86979, d.f = 3, p= 0.276	<u>High School Education</u> • 2006- X^2- 300.8247, d.f = 4, p < 0.001 • 2015 - X^2- 1592.973, d.f = 4, p < 0.001
<u>Family Income</u> • 2006- X^2- 83.40084, d.f = 3, p < 0.001 • 2015 - X^2- 866.9885, d.f = 3, p < 0.001	<u>Mothers Education</u> • 2006- X^2- 354.078, d.f = 4, p < 0.001 • 2015 - X^2- 2149.946, d.f = 4, p < 0.001
<u>Sex</u> • 2006- X^2- 28.02522, d.f = 1, p < 0.001 • 2015 - X^2- 183.2384, d.f = 1, p < 0.001	<u>Fathers Education</u> • 2006- X^2- 273.3705, d.f = 4, p < 0.001 • 2015 - X^2- 1535.568, d.f = 4, p < 0.001

Mathematics 3.2.2

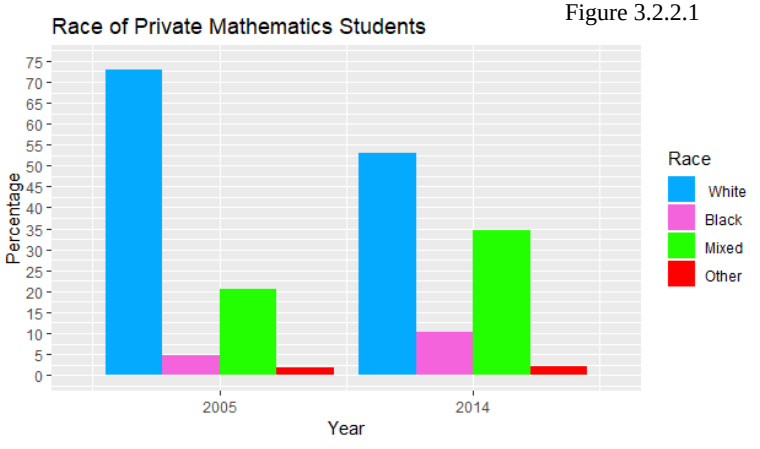


Figure 3.2.2.1

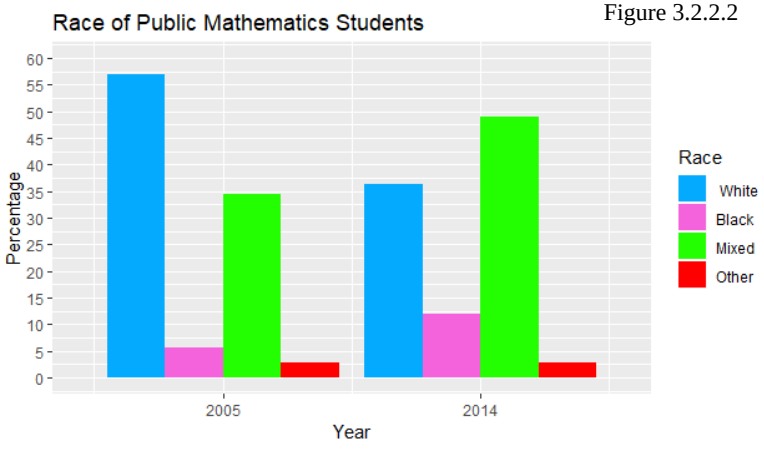
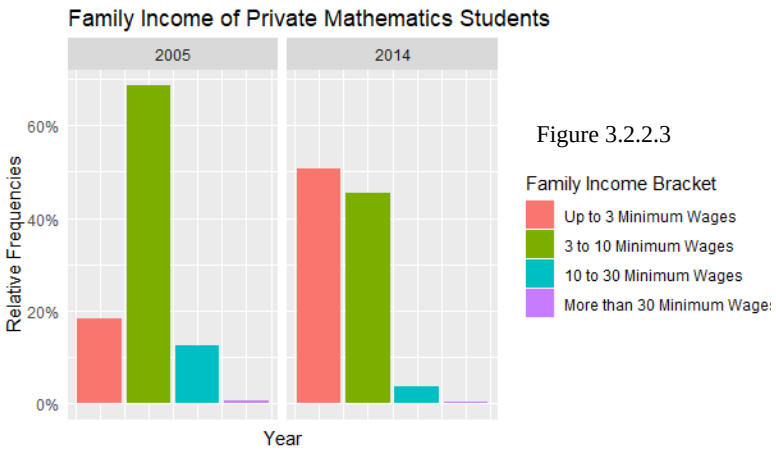


Figure 3.2.2.2



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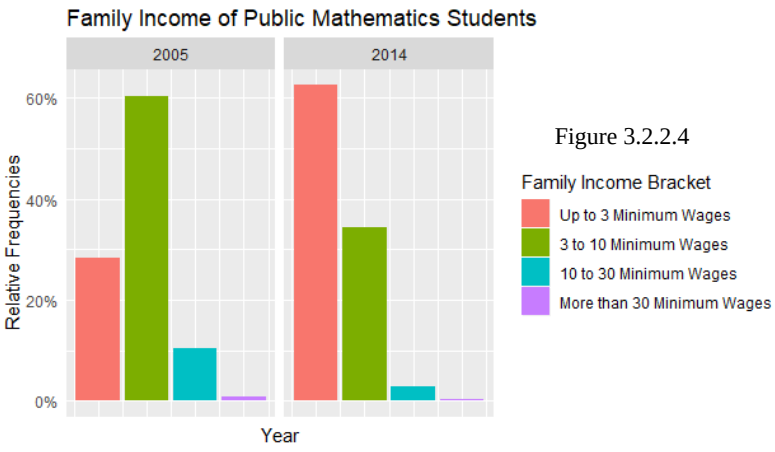


Figure 3.2.2.4

Chi- Square Results

<u>Race</u> • 2005- X^2-137.1377, d.f. = 3, p < 0.001 • 2014 - X^2-379.5414, d.f. = 4, p < 0.001	<u>High School Education</u> • 2005- X^2- 18.33013, d.f. = 4, p < 0.01 • 2014 – X^2 -37.07773 d.f. = 4, p < 0.001
<u>Family Income</u> • 2005- X^2- 68.33014, d.f. = 3, p < 0.001 • 2014 - X^2- 191.2711, d.f. = 3, p < 0.001	<u>Mothers Education</u> • 2005- X^2 - 35.29487 d.f. = 4, p < 0.001 • 2014 - X^2- 49.25846 d.f. = 4, p < 0.001
<u>Sex</u> • 2005- X^2- 93.45713, d.f. = 1, p < 0.001 • 2014 - X^2- 484.7732, d.f. = 1, p < 0.001	<u>Fathers Education</u> • 2005- X^2- 39.07632 d.f. = 4, p < 0.001 • 2014 - X^2 70.0515 d.f. = 4, p < 0.001

Computing Science 3.2.3

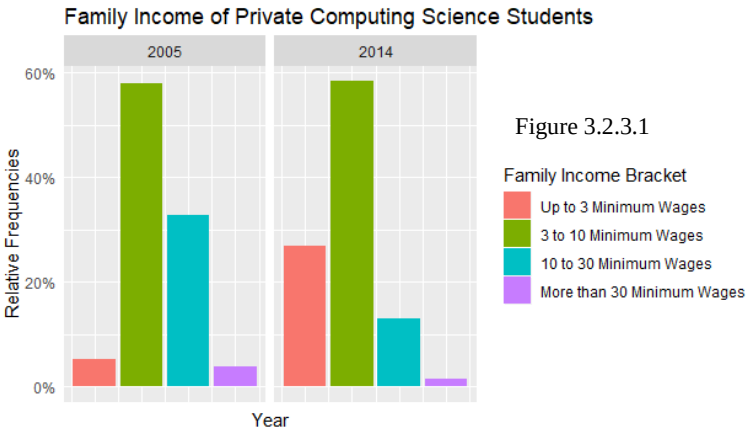
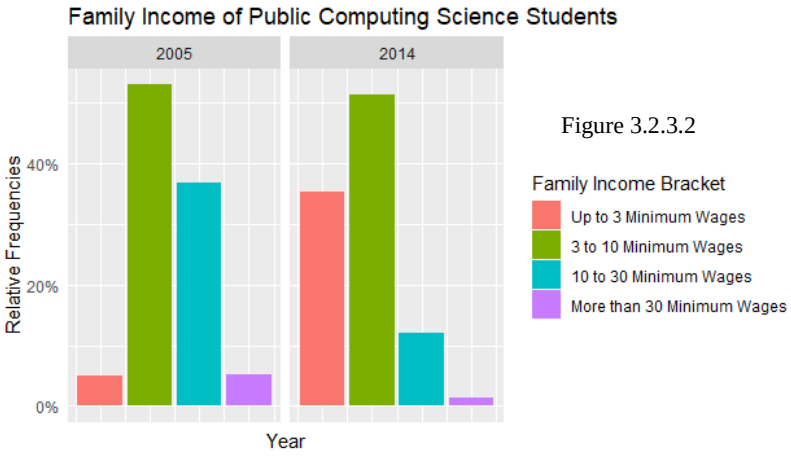


Figure 3.2.3.1



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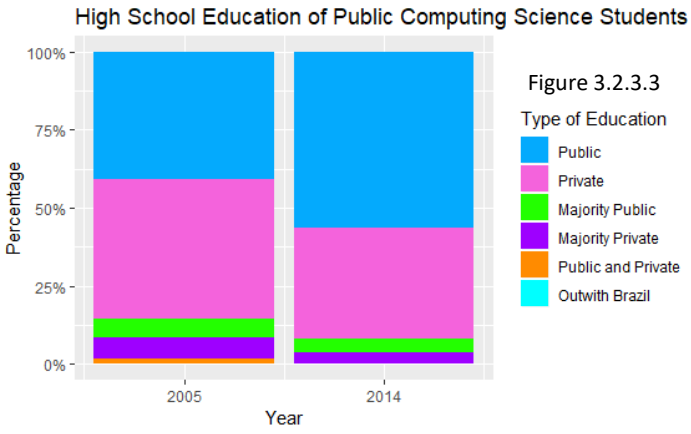


Figure 3.2.3.3

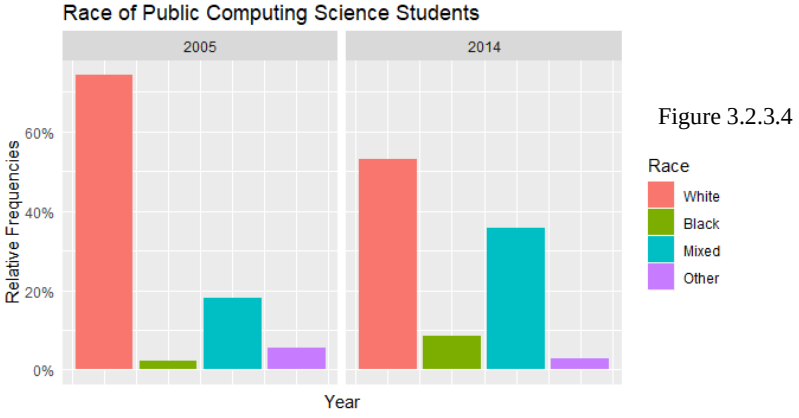


Figure 3.2.3.4

Chi – Square Results

Race • 2005- X^2- 7.867644, d.f. = 4, p = 0.096 • 2014 - X^2- 186.5795 d.f. = 4, p < 0.001	High School Education • 2005- X^2- 43.30891, d.f. = 4, p < 0.001 • 2014 – X^2 - 36.03104 d.f. = 4, p < 0.001
Family Income • 2005- X^2- 14.67788, d.f. = 3, p < 0.01 • 2014 - X^2- 86.53757 d.f. = 3, p < 0.001	Mothers Education • 2005- X^2 - 73.80931, d.f. = 4, p < 0.001 • 2014 - X^2- 123.299 d.f. = 4, p < 0.001
Sex • 2005- X^2- 1.807191, d.f. =1, p = 0.179 • 2014 - X^2- 173.4974 d.f. = 1, p < 0.001	Fathers Education • 2005- X^2- 74.64382, d.f. = 4, p < 0.001 • 2014 - X^2 - 121.3621, d.f. = 4, p < 0.001

Change in Public and Private 3.2.4

Before analysing the above results it's important to note that enrolment in Brazilian universities in the last two decades has increased greatly and due to private universities being easier to access the number of students opting into these institutions is much greater than those going to public institutions (77.07% of all enrolled students in 2016 attended private institutions). Once again change is mainly seen in race, family income and type of high school the students attended, however more change appears to be occurring within the prestigious public universities. For example, when looking at the graphs for family income it can be seen that in Computing there was a 30.16% increase in those from the poorest income bracket in public institutions and a 34.2% increase in Mathematics (whereas in private universities they increased 21.74% and 31.95% respectively). Looking at the graphs for high school education in 2005 or 2006 (if not above located in the appendix) a common trend can be seen, more students from private high schools went on to enrol in public universities, however nine years later there has been an increase in the number of students from public high schools (especially in both public and private aspects of Computing with a 16% and 14% increase in students that attended low-quality public schools, respectively). Both types of higher education are becoming more diverse (public at a quicker rate than private) in terms of the race of students with very similar changes to the first research question. The chi – square tests highlighted in yellow show significant evidence that, that particular variable did effect which type of university the students progressed too. The ones highlighted in red show change that occurred between the two years analysed, for instance when looking at race in Law School we can see that in 2006 race did have an effect on which type of university students would end up going to but by 2015 this had changed so that race had no effect on the type of universities students entered. In Mathematics there seem to be no significant change on the effectiveness of the variables, this could be due to this course already having large numbers of students from lower socioeconomic backgrounds, hence the increase was not registered. Computing shows that both race and sex affected which type of university students went to in 2005 but by 2014 these factors no longer affected their likelihood of attending particular institutions. These results show that the policies put in place have also had an effect on the type of university as those with lower socioeconomic backgrounds are increasingly finding their way into the prestigious public institutions.

Day and Night Courses 3.3

The analysis for day and night courses is very similar to that of the public and private universities. The reason it's important to look at the change between the time of day students attend university is because it's more likely that poorer students attend at night in order to support themselves financially and it will be interesting to see whether the policies implemented to help those from lower socioeconomic backgrounds have allowed these students to attend during the day instead.

Law 3.3.1

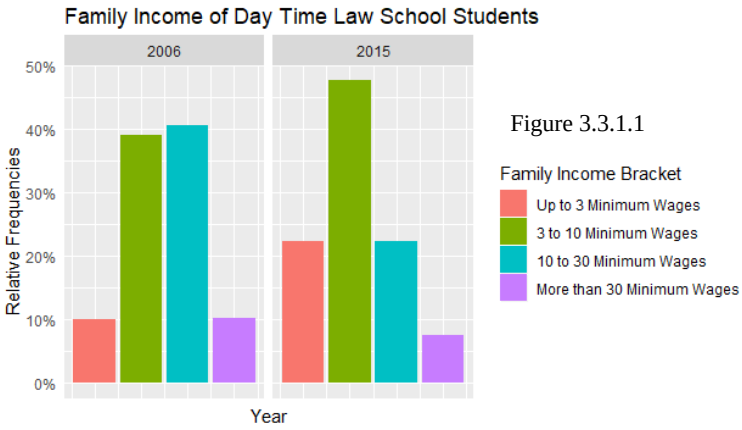


Figure 3.3.1.1

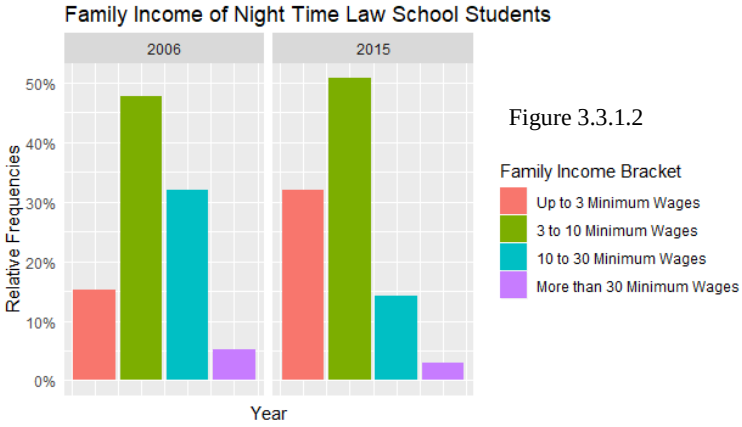


Figure 3.3.1.2

Chi – Square Results

<u>Race</u> • 2006 - X^2 - 7.730775, d.f. = 4, p = 0.102 • 2015 – X^2 - 102.8814, d.f. = 4, p < 0.001	<u>High School Education</u> • 2006- X^2 - 977.62, d.f. = 4, p < 0.001 • 2015 - X^2 - 5366.997, d.f. = 4, < 0.001
<u>Family Income</u> • 2006 - X^2 - 539.9103, d.f. = 3, < 0.001 • 2015 - X^2 - 2972.323, d.f. = 3, < 0.001	<u>Mothers Education</u> • 2006- X^2- 710.9116, d.f. = 4, p < 0.001 • 2015 - X^2 - 3499.417, d.f. = 4, p < 0.001
<u>Sex</u> • 2006- X^2 - 397.0839, d.f. = 1, p < 0.001 • 2015 - X^2 - 1 1131.872, d.f. = 1, p < 0.001	<u>Fathers Education</u> • 2006 - X^2 - 689.9677, d.f. = 4, p < 0.001 • 2015 - X^2 - 3332.807, d.f. = 4, p < 0.001

Mathematics 3.3.2

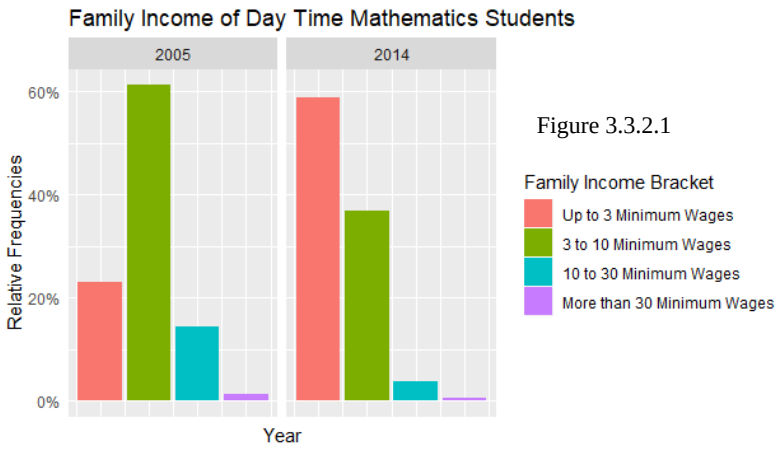


Figure 3.3.2.1

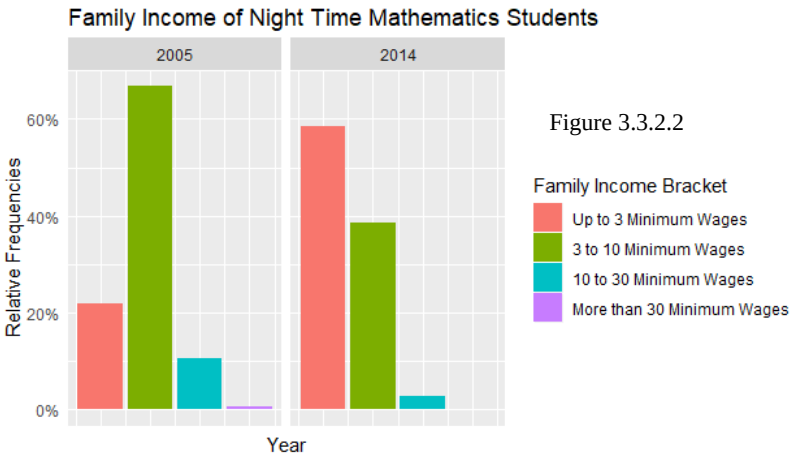


Figure 3.3.2.2

Chi-Square Results

Race • 2005- X^2- 42.42297, d.f. = 4, p < 0.001 • 2014 - X^2- 81.89534, d.f. = 4, p < 0.001	High School Education • 2005- X^2- 34.1229, d.f. = 4, p < 0.001 • 2014 – X^2 - 104.7209, d.f. = 4, p < 0.001
Family Income • 2005- X^2- 22.30628, d.f. = 3, p < 0.001 • 2014 - X^2- 1 31.10539, d.f. = 3, p < 0.001	Mothers Education • 2005- X^2 - 25.03929, d.f. = 4, p < 0.001 • 2014 - X^2- 25.6067, d.f. = 4, p < 0.001
Sex • 2005- X^2- 1.224034, d.f. = 1, p < 0.001 • 2014 - X^2- 0.4995896, d.f. = 1, p < 0.001	Fathers Education • 2005- X^2 54.94382, d.f. = 4, p < 0.001 • 2014 - X^2 47.40047, d.f. = 4, p < 0.001

Computing Science 3.3.3

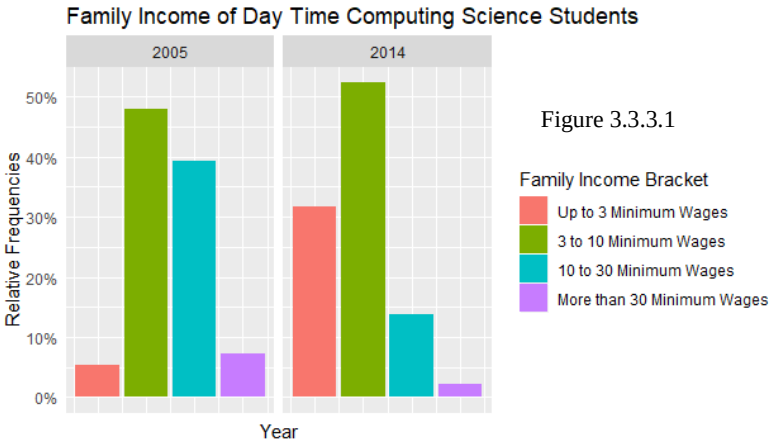


Figure 3.3.3.1

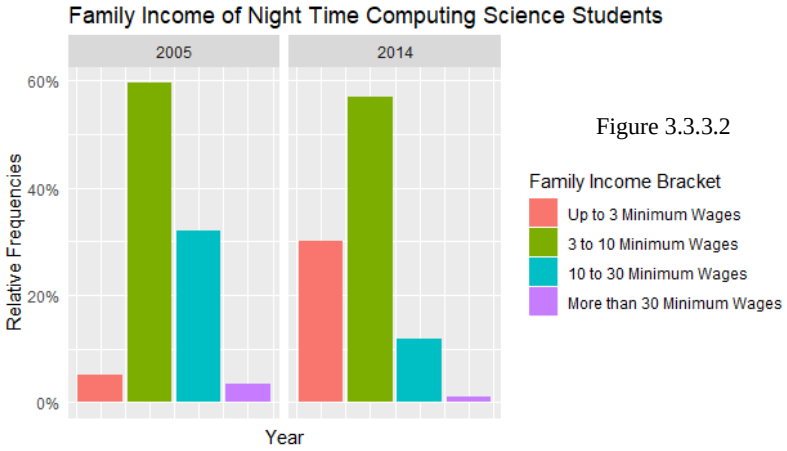


Figure 3.3.3.2

Chi – Square Results

Race • 2005- X^2- 8.771436, d.f. = 4, p = 0.067 2014 - X^2- 67.7276, d.f. = 4, p < 0.001	High School Education • 2005- X^2- 259.4449, d.f. = 4, p < 0.001 • 2014 – X^2 - 211.5636, d.f. = 4, p < 0.001
Family Income • 2005- X^2- 103.580, d.f. = 3, p < 0.001 • 2014 - X^2- 34.57014, d.f. = 3, p < 0.001	Mothers Education • 2005- X^2 - 311.0522, d.f. = 4, p < 0.001 • 2014 - X^2- 154.0308, d.f. = 4, p < 0.001
Sex • 2005- X^2 8.392014, d.f. = 1, p < 0.001 • 2014 - X^2- 61.36031, d.f. = 1, p < 0.001	Fathers Education • 2005- X^2- 264.2558, d.f. = 4, p < 0.001 • 2014 - X^2 - 83.02411, d.f. = 4, p < 0.001

Change in Day and Night Courses 3.3.4

In Brazilian universities night courses are very common with 52% of people taking them instead of day courses as of 2016. The results are very similar to the other research questions showing great increase of students from families with an income of "up to three minimum wages", as well as increases in non-white students and those from public high schools, in

other words lower socioeconomic backgrounds. If we compare day to night we see more accurately which types of student are studying these courses, such as more men study at night than during the day, this is most likely due to them working in order to provide for their families. Consistently those from public high school's study at night, again this could be due to coming from poorer families and having to pay their way through their education. From the results it appears that those from lower socioeconomic backgrounds are more likely to study at night time and this is what was previously expected. In regards to the chi – square tests (which are analysing whether or not each variable had an effect on what time of day students attended higher education) very few show change over the nine years of this research, the ones which do are highlighted (in the same way as public and private).

Conclusion 3.4

Overall we see a clear increase in students from lower socioeconomic backgrounds across a wide variety of courses. Elite courses such as medicine are slightly behind, but improving steadily as the expansion of the higher education system continues. The policies put in place in the early 2000s by the Brazilian government have made a significant change in the number of students coming from low income families. The affirmative action policies have increased the number of mixed race students substantially implying that these policies have been successful however looking at the makeup of the Brazilian population (which shows that Brazil is a majority-minority with 52.3% of Brazilians identifying as non-white) the results are far less impressive (IGBE, 2010). Yet the progress that has been made for students from lower socioeconomic backgrounds should not be diminished. Prestigious public universities are also becoming more diverse, as was expected due to the majority of policies being aimed at these institutions. This can be explained by the class shifts as people from lower socioeconomic backgrounds are more likely to attend these universities at night, whereas those from advantageous backgrounds attend during day shifts. To further improve the chances of those from lower socioeconomic backgrounds in the higher education system, the Brazilian government need to focus on the lower years of schooling. As of 2010 Brazil had an adult literacy rate of 9.6% (IGBE, 2010), the country needs to work on improving this as those who are illiterate most likely come from lower social classes, and this is a skill they should have learned in basic schooling which would have gave them the tools and potential to carry on within education and further the expansion of the higher education system. The government also need to educate students more about the financial and general benefits of gaining a higher education degree, as this will encourage more students to study harder and achieve the required marks on the competitive entrance exam and in return increase social mobility in Brazil.

4 Evaluation

This research could have been done differently: by varying the selection of courses different results may have been provided. Also different methods of creating results could have been used such as logistic regression which would have allowed the creation of an algorithm which could then be used to make predictions on how certain variables (such as, parental education and race) would affect the chances of students attending a course at a public or private institution, as well as during day or night shifts. If this research was to be continued it would be appropriate to investigate those students that drop out between their first and final year to

discover which type of socioeconomic background they were from and if the dropout rate has changed over the same twelve-year time period (which would tell us more about the success and failures of the expansion of the higher education system). Also comparing the results to the greater Brazilian population would be useful as it would allow comparisons to be made with the general population and see how the socioeconomic profile of students varies from that of non-students, giving a better view of how far the system still has to come.

5 Appendix

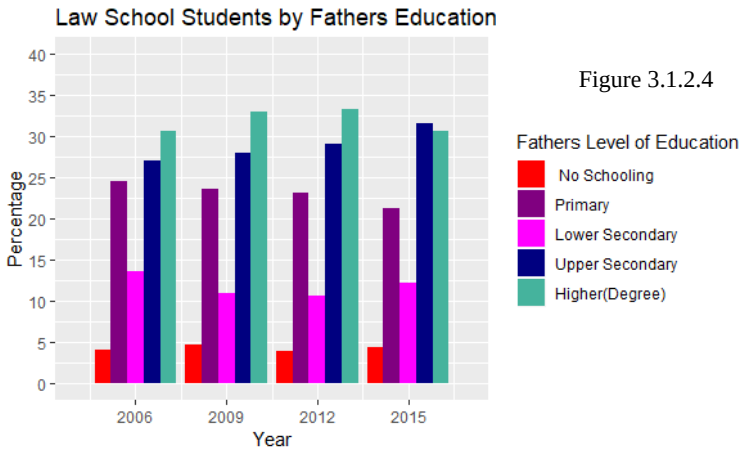


Figure 3.1.2.4

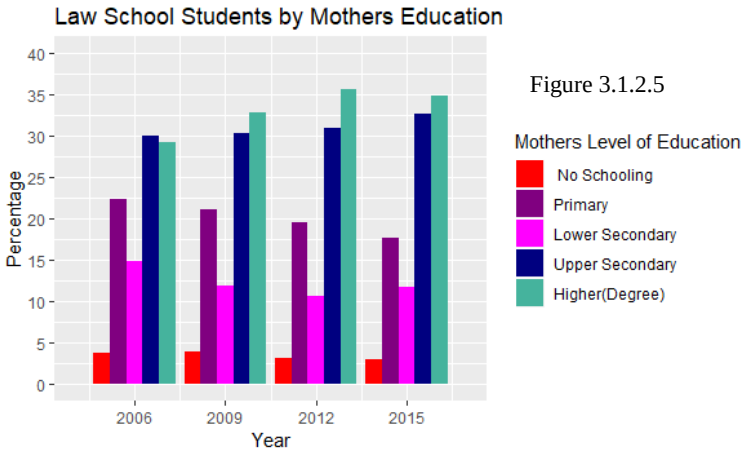
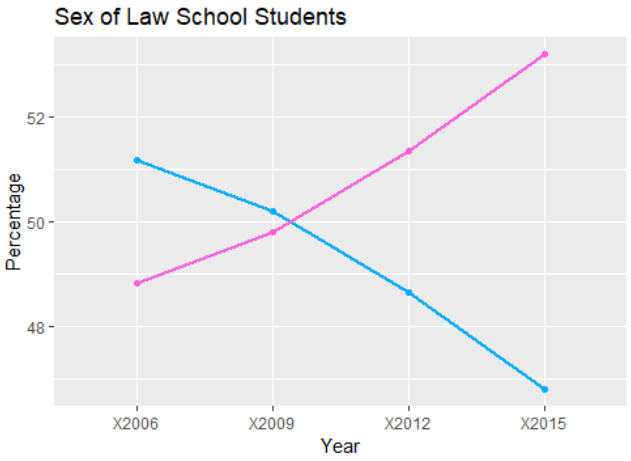


Figure 3.1.2.5



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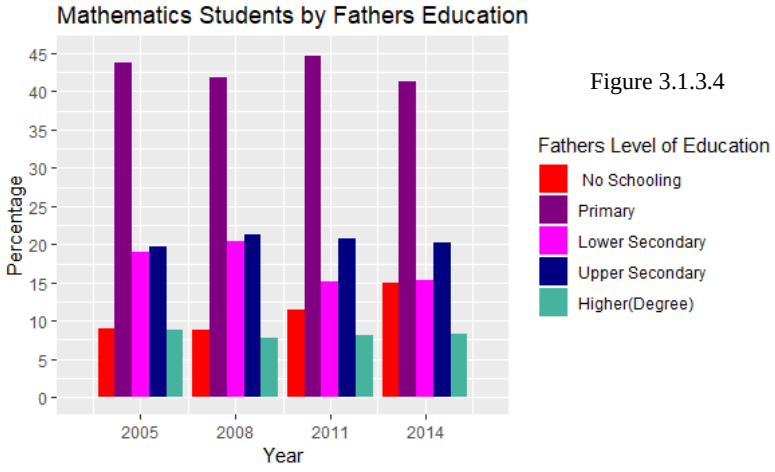
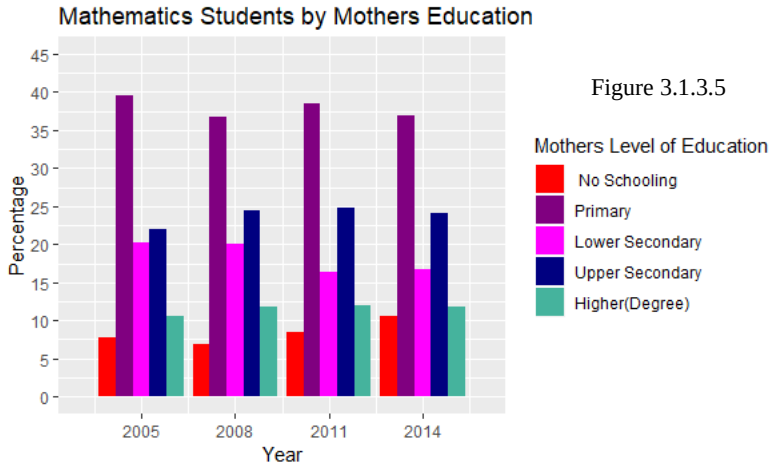


Figure 3.1.3.4



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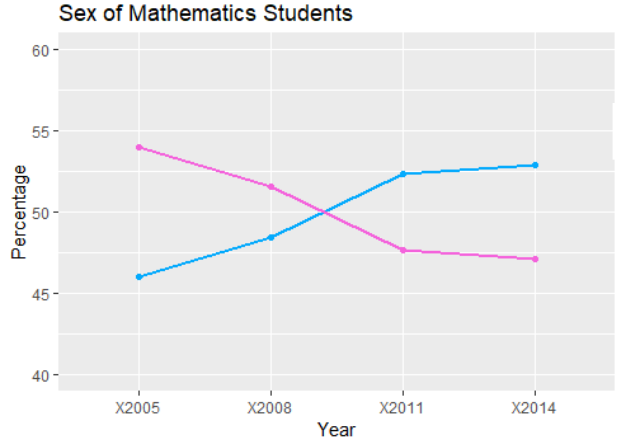

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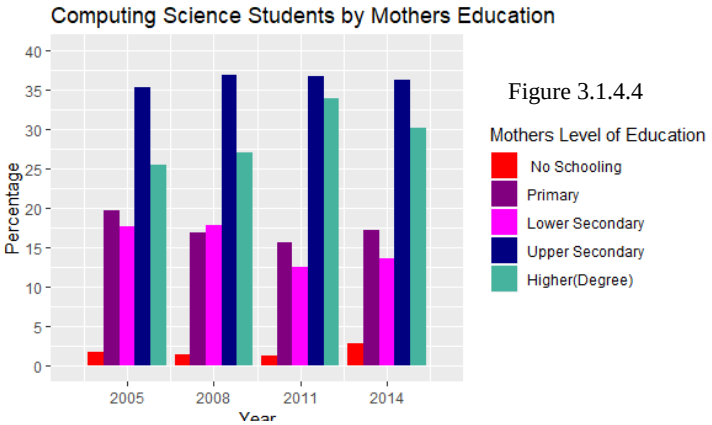

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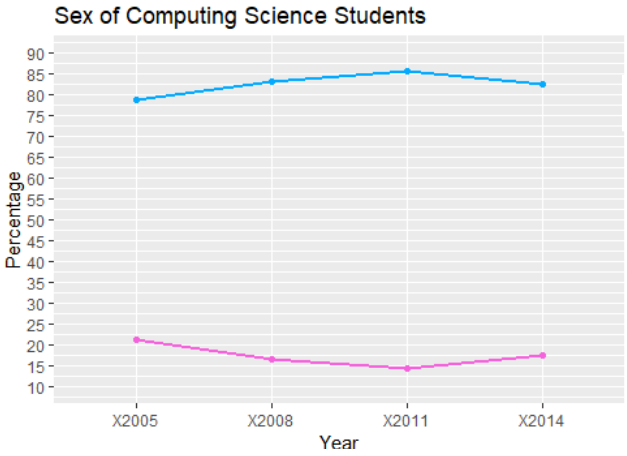

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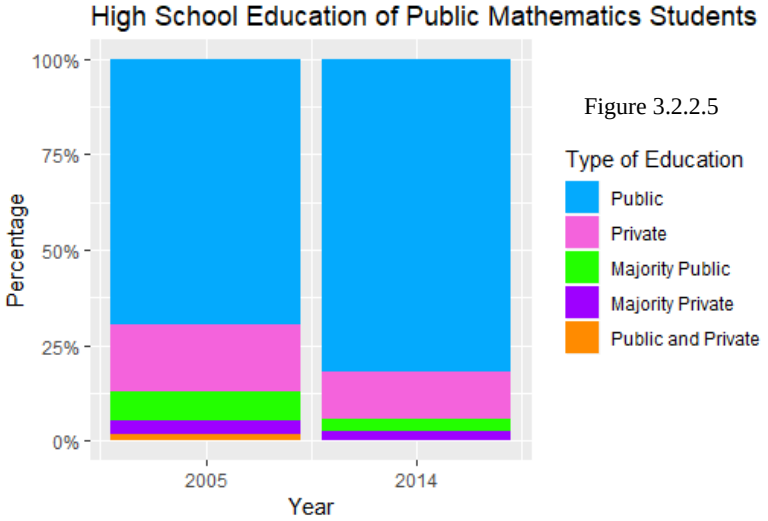

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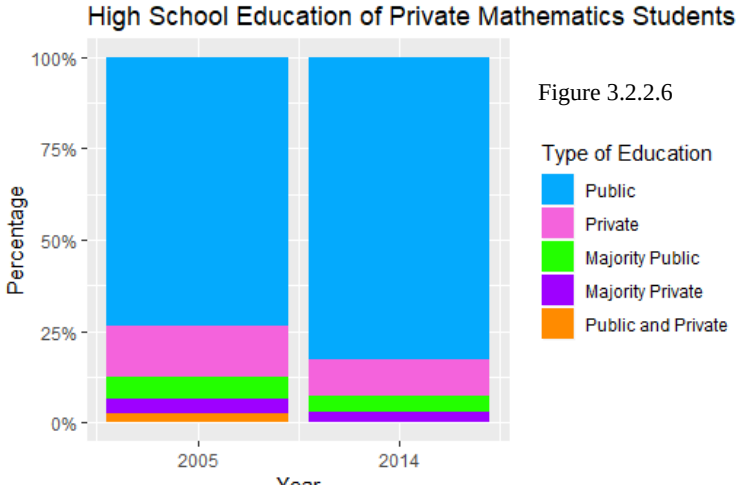

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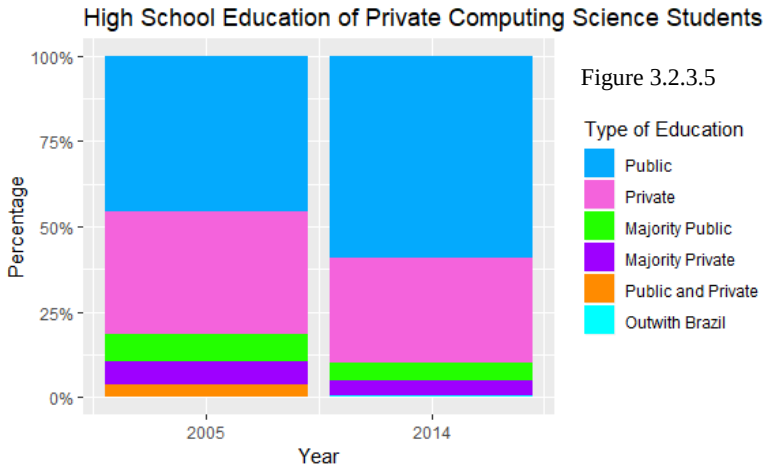

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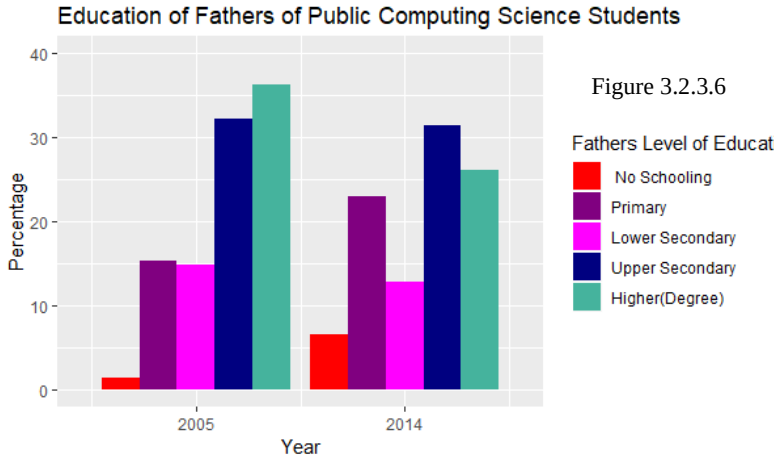

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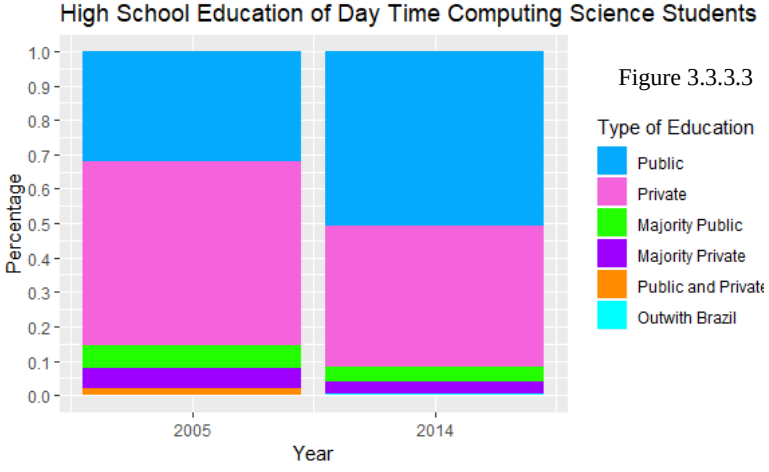

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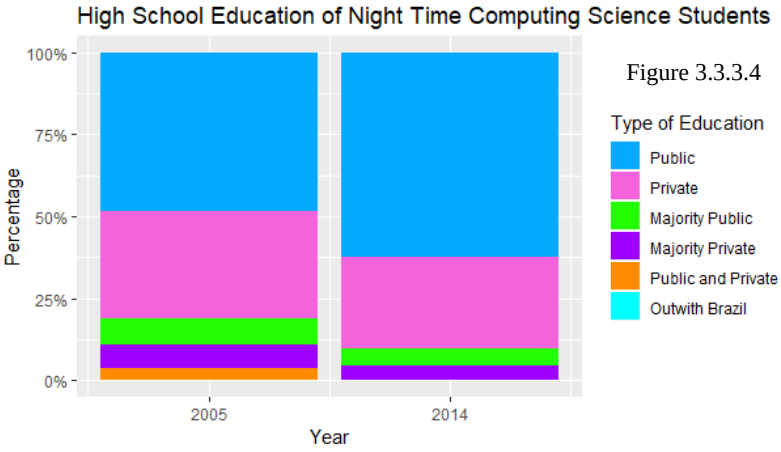

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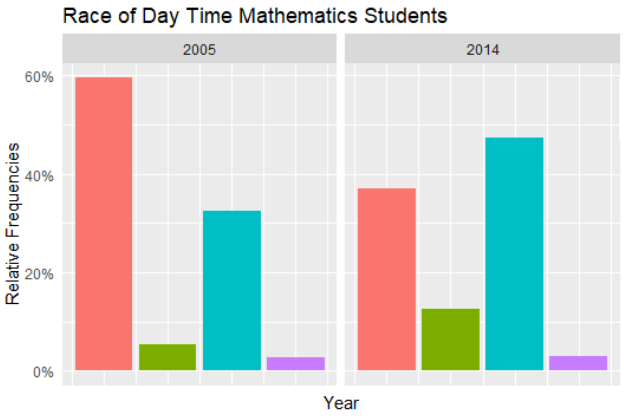

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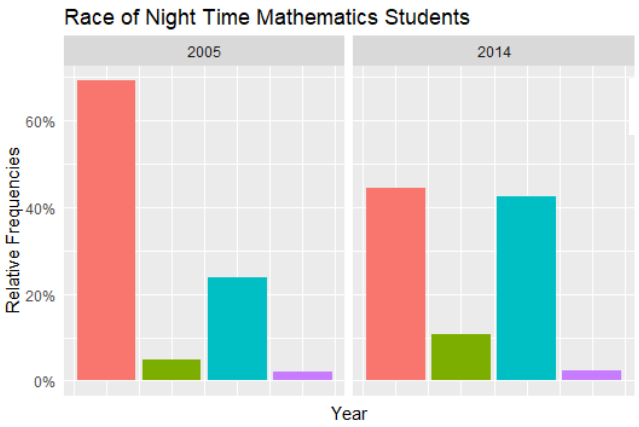

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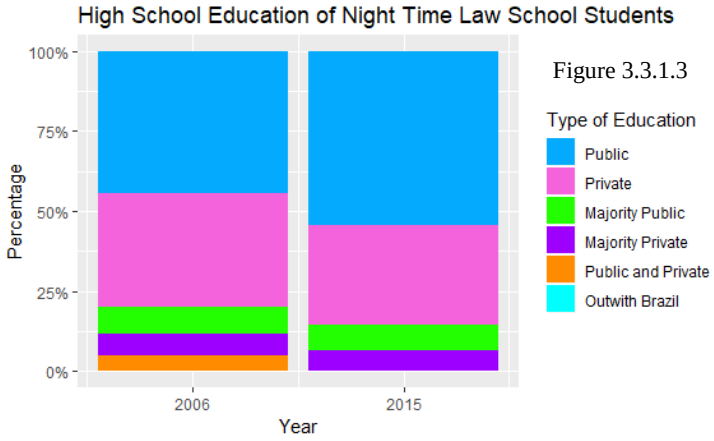

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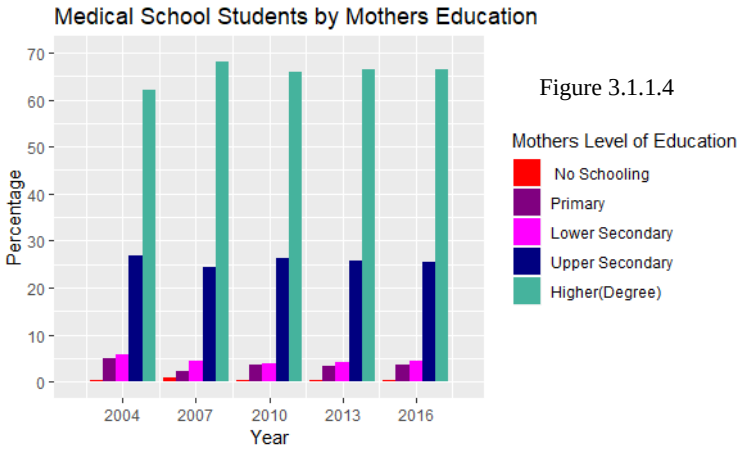

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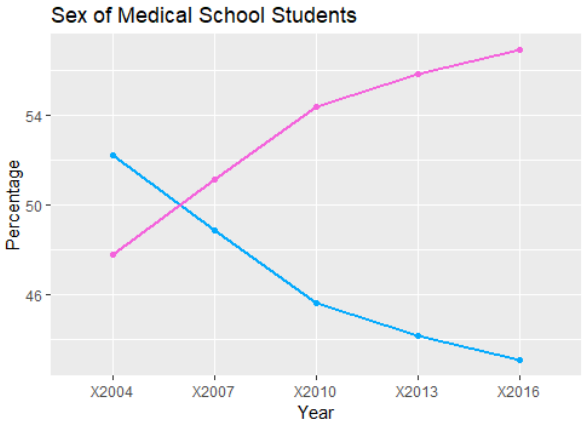

Figure 3.1.1.5

Law Students by Type of University

Variable		2006				2015			
		Public		Private		Public		Private	
		Number of Students	Percentage of Students	Number of Students	Percentage of Students	Number of Students	Percentage of Students	Number of Students	Percentage of Students
Sex	Male	2133	**55.17%**	14947	**50.65%**	7415	49.16%	51035	46.47%
	Female	1733	44.83%	14565	49.35%	7669	**50.84%**	58798	**53.53%**
	Total	3866	100.00%	29512	100.00%	15084	100.00%	109833	100.00%
Race	White	2193	**70.67%**	18490	**75.72%**	8354	**61.47%**	59964	**61.33%**
	Black	116	3.74%	872	3.57%	1012	7.45%	7021	7.18%
	Mixed	702	22.62%	4391	17.98%	3921	28.85%	28725	29.38%
	Other	92	2.96%	666	2.73%	304	2.24%	2059	2.10%
	Total	3103	100.00%	24419	100.00%	13591	100.00%	97769	100.00%
Family Income	Up to 3 Minimum Wages	304	9.84%	3422	14.09%	2762	20.32%	29419	30.09%
	3 to 10 Minimum Wages	1302	**42.12%**	11016	**45.35%**	6743	**49.61%**	48630	**49.74%**
	10 to 30 Minimum Wages	1218	39.40%	8261	34.01%	3272	24.07%	15618	15.97%
	30 or more Minimum Wag	267	8.64%	1592	6.55%	814	5.99%	4102	4.20%
	Total	3091	100.00%	24291	100.00%	13591	100.00%	97769	100.00%
High School Education	Public	920	29.58%	9882	**40.45%**	5619	41.36%	47957	**49.06%**
	Private	1731	**55.66%**	9668	39.58%	6764	**49.79%**	35891	36.72%
	Majority in Private	191	6.14%	1980	8.11%	521	3.84%	7396	7.57%
	Majority in Public	179	5.76%	1672	6.84%	599	4.41%	6102	6.24%
	Other	89	2.86%	1227	5.02%	81	0.60%	407	0.42%
	Total	3110	100.00%	24429	100.00%	13584	100.00%	97753	100.00%
Mothers Education	No Schooling	55	1.77%	966	3.96%	325	2.39%	3085	3.16%
	Primary School	452	14.55%	5676	23.27%	1572	11.57%	18126	18.54%
	Lower Secondary	347	11.17%	3719	15.25%	1181	8.69%	11935	12.21%
	Upper Secondary	951	30.62%	7304	**29.94%**	4125	30.35%	32272	33.01%
	Higher (Degree)	1301	**41.89%**	6727	27.58%	6388	**47.00%**	32351	**33.09%**
	Total	3106	100.00%	24392	100.00%	13591	100.00%	97769	100.00%
Fathers Education	No Schooling	71	2.29%	1053	4.33%	502	3.69%	4395	4.50%
	Primary School	521	16.83%	6196	25.46%	2161	15.90%	21492	21.98%
	Lower Secondary	356	11.50%	3397	13.96%	1336	9.83%	12221	12.50%
	Upper Secondary	842	27.21%	6582	27.04%	4092	30.11%	31125	**31.84%**
	Higher (Degree)	1305	**42.16%**	7110	**29.21%**	5500	**40.47%**	28536	29.19%
	Total	3095	100.00%	24338	100.00%	13591	100.00%	97769	100.00%

Figure 5.1

Law Students by Time of Day Attended

Variable		2006				2015			
		Day		Night		Day		Night	
		Number of Students	Percentage of Students	Number of Students	Percentage of Students	Number of Students	Percentage of Students	Number of Students	Percentage of Students
Sex	Male	4325	42.88%	12755	**54.76%**	16143	39.92%	42307	**50.08%**
	Female	5761	**57.12%**	10537	45.24%	24291	**60.08%**	42176	49.92%
	Total	10086	100.00%	23292	100.00%	40434	100.00%	84483	100.00%
Race	White	6387	**75.61%**	14296	**74.95%**	23215	**63.39%**	45103	**60.35%**
	Black	268	3.17%	720	3.78%	2421	6.61%	5612	7.51%
	Mixed	1552	18.37%	3541	18.56%	10211	27.88%	22435	30.02%
	Other	240	3.45%	518	2.72%	773	2.12%	1590	2.13%
	Total	8447	100.00%	19075	100.00%	36620	100.00%	74740	100.00%
Family Income	Up to 3 Minimum Wages	853	10.17%	2873	15.13%	8210	22.42%	23971	32.07%
	3 to 10 Minimum Wages	3272	38.99%	9046	**47.63%**	17450	**47.65%**	37923	**50.74%**
	10 to 30 Minimum Wages	3406	**40.59%**	6073	31.98%	8218	22.44%	10672	14.28%
	30 or more Minimum Wages	860	10.25%	999	5.26%	2742	7.49%	2174	2.91%
	Total	8391	100.00%	18991	100.00%	36620	100.00%	74740	100.00%
High School Education	Public	2327	27.51%	8475	**44.42%**	12800	34.96%	40776	**54.57%**
	Private	4630	**54.74%**	6769	35.48%	19447	**53.11%**	23208	31.06%
	Majority in Private	597	7.06%	1574	8.25%	2055	5.61%	5862	7.85%
	Majority in Public	565	6.68%	1286	6.74%	2052	5.60%	4649	6.22%
	Other	340	4.02%	976	5.12%	262	0.72%	226	0.30%
	Total	8459	100.00%	19080	100.00%	36616	100.00%	74721	100.00%
Mothers Education	No Schooling	246	2.91%	775	4.07%	776	2.09%	2644	3.54%
	Primary School	1364	16.16%	4764	25.00%	4344	11.86%	15354	20.54%
	Lower Secondary	995	11.79%	3071	16.12%	3325	9.08%	9791	13.10%
	Upper Secondary	2535	30.03%	5720	**30.02%**	11407	31.15%	24990	**33.44%**
	Higher (Degree)	3302	**39.11%**	4726	24.80%	16778	**45.82%**	21961	29.38%
	Total	8442	100.00%	19056	100.00%	36630	100.00%	74740	100.00%
Fathers Education	No Schooling	268	3.18%	856	4.50%	1169	3.19%	3728	4.99%
	Primary School	1512	17.95%	5205	**27.38%**	5419	14.80%	18234	24.40%
	Lower Secondary	976	11.59%	2777	14.61%	3666	10.01%	9891	13.23%
	Upper Secondary	2225	26.41%	5199	27.35%	11422	31.19%	23795	**31.84%**
	Higher (Degree)	3443	**40.87%**	4972	26.16%	14944	**40.81%**	19092	25.55%
	Total	8424	100.00%	19009	100.00%	36620	100.00%	74740	100.00%

Figure 5.2

Mathematics Students by Type of University

Variable		2005				2014			
		Public		Private		Public		Private	
		Number of Students	Percentage of Students	Number of Students	Percentage of Students	Number of Students	Percentage of Students	Number of Students	Percentage of Students
Sex	Male	2579	**50.88%**	2168	41.37%	6292	**54.31%**	2887	**50.12%**
	Female	2490	49.12%	3073	**58.63%**	5294	45.69%	2873	49.88%
	Total	5069	100.00%	5241	100.00%	11586	100.00%	5760	100.00%
Race	White	1091	**57.03%**	2086	**72.96%**	3568	36.40%	2577	**53.03%**
	Black	107	5.59%	134	4.69%	1170	11.94%	496	10.21%
	Mixed	661	34.55%	585	20.46%	4792	**48.88%**	1687	34.71%
	Other	54	2.82%	54	1.89%	273	2.79%	100	2.06%
	Total	1913	100.00%	2859	100.00%	9803	100.00%	4860	100.00%
Family Income	Up to 3 Minimum Wages	540	28.33%	524	18.33%	6129	**62.53%**	2458	**50.58%**
	3 to 10 Minimum Wages	1151	**60.39%**	1960	**68.56%**	3371	34.39%	2204	45.35%
	10 to 30 Minimum Wages	198	10.39%	357	12.49%	277	2.83%	182	3.75%
	30 or more Minimum Wages	17	0.89%	18	0.63%	25	0.26%	16	0.33%
	Total	1906	100.00%	2859	100.00%	9802	100.00%	4860	100.00%
High School Education	Public	1333	**69.61%**	2100	**73.45%**	8023	**81.89%**	4016	**82.65%**
	Private	336	17.55%	397	13.89%	1226	12.51%	485	9.98%
	Majority in Private	140	7.31%	170	5.95%	311	3.17%	221	4.55%
	Majority in Public	69	3.60%	121	4.23%	227	2.32%	132	2.72%
	Other	37	1.93%	71	2.48%	10	0.10%	5	0.10%
	Total	1915	100.00%	2859	100.00%	9797	100.00%	4859	100.00%
Mothers Education	No Schooling	156	8.16%	212	7.42%	1081	11.03%	461	9.49%
	Primary School	684	**35.77%**	1203	**42.09%**	3470	**35.40%**	1934	**39.79%**
	Lower Secondary	377	19.72%	585	20.47%	1588	16.20%	865	17.80%
	Upper Secondary	444	23.22%	607	21.24%	2441	24.90%	1099	22.61%
	Higher (Degree)	251	13.13%	251	8.78%	1222	12.47%	501	10.31%
	Total	1912	100.00%	2858	100.00%	9802	100.00%	4860	100.00%
Fathers Education	No Schooling	211	11.06%	213	7.47%	1628	16.61%	562	11.56%
	Primary School	775	**40.62%**	1305	**45.74%**	3939	**40.19%**	2114	**43.50%**
	Lower Secondary	333	17.45%	573	20.08%	1446	14.75%	796	16.38%
	Upper Secondary	390	20.44%	545	19.10%	1986	20.26%	975	20.06%
	Higher (Degree)	199	10.43%	217	7.61%	803	8.19%	413	8.50%
	Total	1908	100.00%	2853	100.00%	9802	100.00%	4860	100.00%

Figure 5.3

Mathematics Students by Time of Day Attended

Variable		2005				2014			
		Day		Night		Day		Night	
		Number of Students	Percentage of Students	Number of Students	Percentage of Students	Number of Students	Percentage of Students	Number of Students	Percentage of Students
Sex	Male	1341	46.94%	3406	45.70%	3239	**53.28%**	5940	**52.72%**
	Female	1516	**53.06%**	4047	**54.30%**	2840	46.72%	5327	47.28%
	Total	2857	100.00%	7453	100.00%	6079	100.00%	11267	100.00%
Race	White	756	**59.53%**	2421	**69.13%**	1894	36.40%	4251	**53.03%**
	Black	67	5.28%	174	4.97%	640	11.94%	1026	10.21%
	Mixed	413	32.52%	833	23.79%	2423	**48.88%**	4056	34.71%
	Other	34	2.68%	74	2.11%	152	2.79%	221	2.06%
	Total	1270	100.00%	3502	100.00%	5109	100.00%	9554	100.00%
Family Income	Up to 3 Minimum Wages	293	23.13%	771	22.04%	3005	**58.83%**	5582	**58.43%**
	3 to 10 Minimum Wages	776	**61.25%**	2335	**66.75%**	1880	36.81%	3695	38.68%
	10 to 30 Minimum Wage	182	14.37%	373	10.66%	197	3.86%	262	2.74%
	30 or more Minimum Wa	16	1.26%	19	0.54%	26	0.51%	15	0.16%
	Total	1267	100.00%	3498	100.00%	5108	100.00%	9554	100.00%
High School Education	Public	838	**65.93%**	2595	**74.08%**	3991	**74.08%**	8048	**84.26%**
	Private	250	19.67%	483	13.79%	768	13.79%	943	9.87%
	Majority in Private	98	7.71%	212	6.05%	206	6.05%	326	3.41%
	Majority in Public	54	4.25%	136	3.88%	129	3.88%	230	2.41%
	Other	31	2.44%	77	2.20%	11	2.20%	4	0.04%
	Total	1271	100.00%	3503	100.00%	5105	100.00%	9551	100.00%
Mothers Education	No Schooling	126	9.92%	242	6.91%	582	11.39%	960	10.05%
	Primary School	476	**37.48%**	1411	**40.31%**	1796	**35.16%**	3608	**37.76%**
	Lower Secondary	236	18.58%	726	20.74%	805	15.76%	1648	17.25%
	Upper Secondary	268	21.10%	783	22.37%	1270	24.86%	2270	23.76%
	Higher (Degree)	164	12.91%	338	9.66%	655	12.82%	1068	11.18%
	Total	1270	100.00%	3500	100.00%	5108	100.00%	9554	100.00%
Fathers Education	No Schooling	152	11.98%	272	7.79%	830	16.25%	1360	14.24%
	Primary School	536	**42.24%**	1544	**44.22%**	2021	**39.57%**	4032	**42.20%**
	Lower Secondary	198	15.60%	708	20.28%	698	13.67%	1544	16.16%
	Upper Secondary	229	18.05%	706	20.22%	1066	20.87%	1895	19.84%
	Higher (Degree)	154	12.14%	262	7.50%	493	9.65%	723	7.57%
	Total	1269	100.00%	3492	100.00%	5108	100.00%	9554	100.00%

Figure 5.4

Computing Science Students by Type of University

Variable		2005				2014			
		Public		Private		Public		Private	
		Number of Students	Percentage of Students	Number of Students	Percentage of Students	Number of Students	Percentage of Students	Number of Students	Percentage of Students
Sex	Male	2291	**79.72%**	10050	**78.56%**	4252	**77.62%**	5699	**86.76%**
	Female	583	20.29%	2743	21.44%	3002	22.38%	7377	13.24%
	Total	2874	100.00%	12793	100.00%	7254	100.00%	13076	100.00%
Race	White	992	**74.14%**	5357	**74.98%**	2612	**52.97%**	3821	**65.74%**
	Black	30	2.24%	231	3.23%	418	8.48%	371	6.38%
	Mixed	242	18.09%	1248	17.47%	1755	35.59%	1464	25.19%
	Other	74	5.53%	309	4.33%	146	2.96%	156	2.68%
	Total	1338	100.00%	7145	100.00%	4931	100.00%	5812	100.00%
Family Income	Up to 3 Minimum Wages	68	5.07%	370	5.20%	1737	35.23%	1566	26.94%
	3 to 10 Minimum Wages	710	**52.95%**	4126	**57.97%**	2532	**51.35%**	3395	**58.41%**
	10 to 30 Minimum Wages	492	36.69%	2338	32.85%	592	12.01%	757	13.03%
	30 or more Minimum Wages	71	5.30%	283	3.98%	70	1.42%	94	1.62%
	Total	1341	100.00%	7117	100.00%	4931	100.00%	5812	100.00%
High School Education	Public	549	40.91%	3268	**45.71%**	2780	**56.39%**	3448	**59.35%**
	Private	596	**44.41%**	2566	35.89%	1748	35.46%	1772	30.50%
	Majority in Private	85	6.33%	563	7.87%	222	4.50%	313	5.39%
	Majority in Public	88	6.56%	491	6.87%	165	3.35%	253	4.36%
	Other	24	1.79%	262	3.66%	15	0.30%	24	0.41%
	Total	1342	100.00%	7150	100.00%	4930	100.00%	5810	100.00%
Mothers Education	No Schooling	15	1.12%	133	1.87%	201	4.08%	98	1.69%
	Primary School	207	15.51%	1457	20.43%	893	18.11%	950	16.35%
	Lower Secondary	178	13.33%	1322	18.54%	594	12.05%	863	14.85%
	Upper Secondary	489	**36.63%**	2503	**35.10%**	1624	**32.93%**	2272	**39.09%**
	Higher (Degree)	446	33.41%	1716	24.06%	1619	32.83%	1629	28.03%
	Total	1335	100.00%	7131	100.00%	4931	100.00%	5812	100.00%
Fathers Education	No Schooling	20	1.50%	145	2.03%	326	6.61%	192	3.30%
	Primary School	205	15.32%	1600	22.43%	1134	23.00%	1096	18.86%
	Lower Secondary	198	14.80%	1159	16.25%	632	12.82%	867	14.92%
	Upper Secondary	431	32.21%	2388	**33.48%**	1550	**31.43%**	2188	**37.65%**
	Higher (Degree)	484	**36.17%**	1840	25.80%	1289	26.14%	1469	25.28%
	Total	1338	100.00%	7132	100.00%	4931	100.00%	5812	100.00%

Figure 5.5

Computing Science Students by Time of Day Attended

Variable		2005				2014			
		Day		Night		Day		Night	
		Number of Students	Percentage of Students	Number of Students	Percentag e of	Number of Students	Percentage of Students	Number of Students	Percentage of Students
Sex	Male	2729	**80.57%**	9612	**78.27%**	3516	**79.07%**	6435	**84.67%**
	Female	658	19.43%	2668	21.73%	931	20.94%	1165	15.33%
	Total	3387	100.00%	12280	100.00%	4447	100.00%	7600	100.00%
Race	White	1289	**73.87%**	5060	**75.10%**	2240	**55.36%**	**4193**	**62.61%**
	Black	56	3.21%	205	3.04%	295	7.29%	494	7.38%
	Mixed	300	17.19%	1190	17.66%	1395	34.48%	1824	27.24%
	Other	100	5.73%	283	4.20%	116	2.87%	186	2.78%
	Total	1745	100.00%	6738	100.00%	4046	100.00%	6697	100.00%
Family Income	Up to 3 Minimum Wages	95	5.46%	343	5.11%	1284	31.74%	2019	30.15%
	3 to 10 Minimum Wages	835	**48.02%**	4001	**59.55%**	2118	**52.35%**	3809	**56.88%**
	10 to 30 Minimum Wages	683	39.28%	2147	31.95%	558	13.79%	791	11.81%
	30 or more Minimum Wages	126	7.25%	228	3.39%	86	2.13%	78	1.17%
	Total	1739	100.00%	6719	100.00%	4046	100.00%	6697	100.00%
High School Education	Public	559	32.03%	3258	**48.29%**	2048	**50.63%**	4180	**62.44%**
	Private	936	**53.64%**	2226	32.99%	1667	41.21%	1853	27.68%
	Majority in Private	110	6.30%	538	7.97%	168	4.15%	367	5.48%
	Majority in Public	105	6.02%	474	7.03%	147	3.63%	271	4.05%
	Other	35	2.01%	251	3.72%	15	0.37%	24	0.36%
	Total	1745	100.00%	6747	100.00%	4045	100.00%	6695	100.00%
Mothers Education	No Schooling	17	0.98%	131	1.95%	152	3.76%	147	2.20%
	Primary School	198	11.39%	1466	21.79%	620	15.32%	1223	18.26%
	Lower Secondary	207	11.91%	1293	19.22%	461	11.39%	996	14.87%
	Upper Secondary	616	35.44%	2376	**35.32%**	1343	33.19%	2553	**38.12%**
	Higher (Degree)	700	**40.28%**	1462	21.73%	1470	**36.33%**	1778	26.55%
	Total	1738	100.00%	6728	100.00%	4046	100.00%	6697	100.00%
Fathers Education	No Schooling	22	1.26%	143	2.13%	227	5.61%	291	4.35%
	Primary School	234	13.42%	1571	23.36%	772	19.08%	1458	21.77%
	Lower Secondary	202	11.58%	1155	17.17%	493	12.19%	1006	15.02%
	Upper Secondary	556	31.88%	2263	**33.65%**	1342	**33.17%**	2396	**35.78%**
	Higher (Degree)	730	**41.86%**	1594	23.70%	1212	29.96%	1546	23.09%
	Total	1744	100.00%	6726	100.00%	4046	100.00%	6697	100.00%

Figure 5.6

6 References

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